

Published April 21, 1994 in the Federal Register

Interpretative Bulletin for Manufactured Home Construction

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Office of the Assistant Secretary for Housing-  
Federal Housing Commissioner

[Docket Nos. R-94-1497; FR-2622-N-06;  
and R-94-1632; FR-3380-N-05]

24 CFR Part 3280

## Interpretative Bulletin for Manufactured Home Construction and Safety Standards

AGENCY: Office of the Assistant Secretary for Housing-Federal Housing Commissioner, HUD.

ACTION: Notice of interpretative bulletin.

SUMMARY: HUD published two final rules amending the Federal Manufactured Home Construction and Safety Standards (FMHCSS) on October 25, 1993 (58 FR 54975), and January 14, 1994 (59 FR 2456). Technical corrections for the two rules were published on March 31, 1994 (59 FR 15113). This notice publishes an Interpretative Bulletin that the Department has issued to clarify some aspects of the new standards that have been the subject of questions from the industry and the public.

DATE: Issued April 15, 1994.

FOR FURTHER INFORMATION CONTACT: David C. Nimmer, Director, Office of Manufactured Housing and Regulatory Functions, Department of Housing and Urban Development, 451 Seventh Street SW., ATTN: Mailroom B-133, Washington, DC 20410-8000. Telephones: (voice) (202) 755-7410; (TDD) (202) 708-4594. (These are not toll-free numbers.)

SUPPLEMENTARY INFORMATION: Accordingly, the following Interpretative Bulletin, which includes the Secretary's finding that it should not be subject to notice-and-comment rulemaking, has been issued by the Department:

### Interpretative Bulletin to the Standards

#### Manufactured Home Construction and Safety Standards 24 CFR Part 3280

Under Section 604 of the National Manufactured Housing Construction and Safety Standards Act of 1974, 42 U.S.C. 5403, the Secretary of the U.S. Department of Housing and Urban Development ("HUD") is authorized to issue, amend and revoke by order appropriate Federal manufactured home construction and safety standards. On October 25, 1993, (58 FR 54975) and January 14, 1994, (59 FR 2456), HUD published certain changes to the Federal Manufactured Home Construction and Safety Standards for energy conservation standards and new standards for high wind areas, respectively. The effective date of the energy standards is October 25, 1994, while the wind standards are effective on July 13, 1994.

Since the publication of these two rules, the Department has received a number of questions asking for clarification of certain provisions of the rules. Those who requested the clarifications urged the Department to provide a timely response so that industry designers can move forward to revise plans and specifications well ahead of the effective dates of the new standards. HUD recognizes that it is imperative to respond to these requests for clarification as soon as possible to assist Primary Inspection Agencies ("PIAs"), manufacturers and State Administrative Agencies in understanding the changes to

the manufactured housing standards well in advance of their effective dates.

Based on these requests for clarifications, discussions with manufacturers and PIAs and the fact that many of the changes to the standards concern issues of public safety, the Department has concluded under 24 CFR 3282.113 of the Manufactured Home Procedural and Enforcement Regulations that the immediate issuance of guidance to address these technical questions is in the public interest and necessary for the orderly redesign of manufactured homes to meet these two standards before their effective date. Therefore, due to the need for expeditious resolution of these issues and due to that fact that this is not a change in the position or policy of the Department but merely involves technical clarifications, the Secretary deems it not to be in the public interest to issue these interpretations for public comment in the Federal Register or to otherwise treat this Interpretative Bulletin as rulemaking. The Department is providing this guidance to manufacturers and PIAs so that they can proceed immediately with the redesign of their homes. Where necessary, the Department may provide further assistance in these new standards by letter of clarification or by a new Interpretative Bulletin.

The requested clarifications of the Manufactured Home Construction and Safety Standards have been organized into the following questions and answers. While the majority of the questions relate to the interpretation of the standards, several of the questions relate to the enforcement of the standards.

In addition to those answered below, there are several questions which have been submitted to HUD that require additional technical analysis before a decision can be made. These questions will be addressed in a future Interpretative Bulletin or rulemaking.

Other questions revealed the need for corrections to mistakes within the language of the rules and a few questions raised issues that require additional rulemaking. The editorial corrections were made in a correction document published in the Federal Register on March 31, 1994 (59 FR 15113).

#### I. The Energy Standards

Questions: 1. The Effective date of the rule is October 25, 1994. Does this mean that every home that enters production that day is to be built under the new regulations?

Answer: Yes.

2. 24 CFR 3280.103(b)(2)-Would the required kitchen/bath fans constitute a means of achieving the required 0.10 ACH if automatic timers are used to control the fans? This is what the Bonneville Power Administration, accepts for whole house ventilation for their Super Good Cents Program.

Answer: No. These fans are for spot ventilation and may not effectively change the air in other parts of the home.

3. 24 CFR 3280.103(b)(2)-Does 0.035 cfm/sq. ft. floor area have to be used to calculate the required

system capacity, or can 0.10 actual house volume/60 min. be used as an alternative?

Answer: Utilize 0.035 cfm/sq. foot floor area. This formula compensates for the decrease in natural ventilation when ventilation fans are in operation.

4. 24 CFR 3280.103(b)(3)-This section requires whole house ventilation, but limits the positive or negative pressures, depending on the thermal zone. What is meant by "Mechanical systems shall be balanced?"

Answer: The capacity of the intake fans shall be the same as the exhaust fans.

5. 24 CFR 3280.103(b)(3)-Would the equipment for Zones 1 and 2 have to be different? Does this mean a house constructed to Zone 2 insulation cannot be shipped to thermal Zone 1 because of the ventilation system?

Answer: It doesn't have to be different. A Zone 2 home with a balanced mechanical system would be acceptable in Zone 1. Manual or fixed louvers would be acceptable in both zones. One way registers (i.e. those which react to pressure) have to be appropriate to the zone. In Zones 2 and 3, a one way register should be set to relieve a positive interior pressure. In Zone 1, a one-way register should be set to relieve a negative interior pressure.

6. 24 CFR 3280.103(b)(3)-It is also stated that such systems must be "balanced" so as to release any "unbalanced pressure." Isn't it true that a balanced system would not have any positive or negative pressures? Is this two ways of saying the same thing, or are both stipulations necessary?

Answer: Both stipulations are necessary. Please refer to the answers in Questions 4 and 5 for a base reference. A system, for example, is considered balanced when the fan capacities are equal. A passive system is balanced when the system can be expected to release any unbalanced pressure. In actual situations, however, it is recognized that the deliberate movement of air causes unbalanced pressures and this is the reason for the prescription on positive and negative pressures.

7. 24 CFR 3280.103(b)(3)-What kind of mechanical ventilation systems do not create pressure differences? Is the presence of a nearby equivalent passive system enough to say that the system is "balanced"?

Answer: It is recognized that in operation, mechanical systems create unbalanced pressures. Please refer to the answer for Question 6. Where the passive portion of a system is evaluated as the functional equivalent of the mechanical portion, the system is balanced. An equivalent passive system is enough to say the system is balanced. However, if the intake and the exhaust are nearby and there is no provision to circulate the incoming air throughout the house, then there is no whole house ventilation.

8. 24 CFR 3280.103(b)(5)-Would a mechanical system, that works in conjunction with the furnace,

and introduces outside air into the home, but does not exhaust inside air, meet the ventilation requirements if bath/kitchen fans can be used to exhaust inside air?

Answer: No. A mechanical system that works in conjunction with the furnace is acceptable; however, bath and kitchen fans are not acceptable for the exhaust.

9. 24 CFR 3280.103(b)(5)-If the answer to the above question is "No", then would adding a separate exhaust fan, in addition to the above system, meet the requirement?

Answer: Yes.

10. 24 CFR 3280.103(b)(5)-Would adding a one-way register (to depressurize the house) meet the requirements?

Answer: Yes; (The one way register should depressurize only in Zones 2 and 3).

11. 24 CFR 3280.103(b)(6)-This section requires a manual control on the ventilation system. 24 CFR 3280.103(b)(5) says the ventilation system may be integral with the heating and cooling equipment. Does this mean that the homeowner must be able to operate the ventilation system independently of the furnace, or can the two share the same controls?

Answer: They can share the same controls and the ventilation system can be designed to operate in conjunction with and simultaneously with the furnace or air conditioner. An automatic control to operate the system independently of the furnace or air conditioner is permitted. However, in all circumstances there must be the capability for the homeowner to operate the system continuously and independently of any other automatic provision.

12. 24 CFR 3280.103(b)(7)-This section says that the ventilation capacity must be substantiated. What types of calculations or tests are acceptable?

Answer: With mechanical ventilation, a fan or fans rated to provide the required cfm is sufficient. Concerning passive systems, rational assumptions and engineering calculations, or tests will be acceptable when based upon recognized principles and practices. For example, ASHRAE Chapter 23 can be used as a resource.

13. 24 CFR 3280.303(g)-Do old, existing tests that are retested for slight material changes have to be submitted to the Department for another review?

Answer: The existing tests do not need to be resubmitted unless:

1. Minor material substitutions were not verified by tests or engineering analysis by a professional

engineer or architect as having equivalent or superior strength to the material being replaced; or

2. No follow-up testing has been conducted; or

3. Tests were not witnessed by a licensed professional engineer or architect; or

4. Higher design loads are required to be used by the new wind standards which are effective on July 13, 1994.

14. 24 CFR 3280.303(g)-How will the Department notify other manufacturers of a recently approved protocol? Will a new test protocol be distributed to everyone or will it be considered the property of the developing manufacturer?

Answer: The Department will not usually notify other manufacturers since new protocols are often of a proprietary nature.

15. 24 CFR 3280.303(g)-How will the Department assure the manufacturer of a prompt response to a protocol review? Will the Technical Exchange Group be able to develop protocols and ask the DTAG to approve and distribute them?

Answer: The Department will make every effort to review test protocols promptly in those cases where manufacturers will not be using recognized testing procedures. We do not anticipate that the Technical Exchange Group will be asked to develop test protocols.

16. 24 CFR 3280.504(c)(1)(I)-Does Section 24 CFR 3280.504(c)(1)(I) allow construction of ventilated roof homes without eaves (e.g. single section homes) but with "low roof vents?" If so, is a 1 inch space required between the top of the insulation and the roof sheathing when there is no designed air passage to that point?

Answer: Where eaves or overhangs are not part of the design, low roof vents can be used. However, a 1-inch minimum air space directly underneath the most outboard point of the vent is needed for a fresh air path for the length of the home to insure that the low roof vents function.

17. 24 CFR 3280.504(c)(2)-Would polystyrene or R-5 fiberglass insulation be considered sheathing, if it is installed over the roof truss top chord on metal roof units, and if it is to be used as a sound deadener? The requirement states "... homes constructed with metal roofs and having no sheathing or underlayment installed, are not required to be provided with attic or roof cavity ventilation ...". Is the above type of roof construction required to be ventilated?

Answer: A rigid polystyrene sheath would be considered a sheathing. Fiberglass batts would not be. The rigid polystyrene sheath would require the roof to be ventilated.

18. 24 CFR 3280.506(a)-"The overall coefficient of heat transmission ( $U_o$ ) of the manufactured home for the respective zones and an indoor design of 70 F, including internal and external ducts, and excluding infiltration ventilation and condensation control, shall not . . . ." Should there be a comma (,) between infiltration and ventilation? If the answer is yes, does this mean to exclude only the passive and/or active 0.10 air changes per hour referred to in 24 CFR 3280.103(b)(2), and/or does this mean the 0.10 ACH "plus" the natural infiltration and exfiltration of 0.25 ACH referred to in 24 CFR 3280.103(b)? If the answer is no, what does this mean?

Answer: A comma (,) should be between infiltration and ventilation, and the 0.10 ACH and the 0.25 ACH are excluded from the calculation.

19. 24 CFR 3280.508-How is duct loss calculated when duct is located (sic) between the floor insulation and the floor (conditioned area) for single wides? We suggest there is none.

Answer: Refer to paragraph 3.2 of the document "Overall U-values and heating, cooling loads Manufactured Homes". The duct losses for this configuration are not included in the calculation. The space where the duct is located is considered conditioned and the floor deck is not included in the calculation.

20. 24 CFR 3280.508-What is the duct loss factor when the duct is located between the floor insulation and the floor for double wides except for the crossover duct? We suggest 2% of calculated transmission ( $U_o$ ) loss.

Answer: The external ducts are considered to be a component of the homes. The area of the duct exposed to the exterior and the level of insulation installed are summarized with the overall envelope area. Please note that 24 CFR 3280.506 (a) prevails over paragraph 4.4 of the document "Overall U-values and heating, cooling loads Manufactured Homes".

21. 24 CFR 3280.508-Are people loads (one person per bedroom plus one) and appliance loads (1,200 BTUH) ignored when calculating "maximum" heat loss allowed by the  $U_o$ ? We assume this is ignored, except when estimating annual energy usage if desirable under 24 CFR 3280.508(f), "Annual Energy Used Based Compliance".

Answer: People loads are not included in the determination of the  $U_o$ , when the "Annual Energy Used Based Compliance" method is used (24 CFR 3280.508(b)1). This section says that all heat loss calculations should be consistent with the procedures in the February 1992 document by PNL.

22. 24 CFR 3280.506(a)-24 CFR 3280.506(a) says that internal and external duct losses must be considered. The PNL document does not include duct losses. Will the PNL document be revised to include such losses in the overall  $U_o$  heat loss?

Answer: There are no current plans to revise the PNL document. It is subject to change by addition or clarification if there is a need to do so.

23. 24 CFR 3280.508-If external duct losses are to be considered, can the additional area of the cross-over duct be used in the summation of the overall envelope area? If not, it would have to be considered a pure loss.

Answer: The external ducts are considered to be a component of the homes. The area of the duct exposed to the exterior and the level of insulation installed are summarized with the overall envelope area.

24. 24 CFR 3280.508(b)-Blown Insulation:-In appendix B (Page b(I) of the PNL document), the R-value of blown insulation is taken at R-2.5 per inch. In the earlier example (Page 4.4), it is shown to be 3.67 per inch. Which is correct?

Answer: The allowed R-value should be determined from the recognized R-value for the product employed.

25. 24 CFR 3280.508(b)-Insulation in Ceiling: Regarding the examples on Page 54976, is the R-value in the ceiling the total, "nominal" thickness at the peak? Or is the lesser, "effective", or "installed" value of the insulation in the cavity?

Answer: The "as installed" value is to be used.

26. 24 CFR 3280.508(d)-Section 3280.508(d) provides some potential for offering more value to the consumer by considering high energy efficiency heating and cooling equipment. Home manufacturers ordinarily install heating equipment but most cooling equipment is provided and installed by others. Will HUD allow manufacturers to specify on the data plate or elsewhere that the home is designed for minimum SEER (e.g. 12) air conditioning equipment and calculate the credit based on the design even though we do not actually provide the equipment?

Answer: When the home manufacturer does not provide the cooling equipment, the higher energy efficiency credit cannot be used.

27. 24 CFR 3280.510(b)-The requirement states ". . . heating equipment will maintain a 70 degree F temperature inside the home without storm sash or insulating glass in Zones 1 and 2, and with storm sash or insulating glass in Zone 3 . . .". Storm windows may be necessary to meet the significantly lower whole house "U" values required in 24 CFR 3280.506(a) for Zones 1 and 2, as well as Zone 3. For these homes, a certification temperature without storms makes no sense. For heat Zones 1 and 2, may the certification temperature be calculated with storm windows if said home is equipped as such?

Answer: Yes; however, if removable storm windows are provided, the heat loss certification



temperature will be calculated with the storms removed. For permanently installed double or triple glazing, the temperature may be calculated utilizing the window assembly U-value.

28. 24 CFR 3280.806(b)(1). Receptacle outlets within 6 feet of the kitchen sink are now required to be GFCI. Neither section 210-7 of the NEC nor the NEC 1993 Handbook described the location of the receptacle clearly. How is this 6 feet measured? Is it along the wall behind the counter where the sink is located, or a 6-foot diameter circle at the sink corners, etc. \* \* \*?

Answer: It is measured between the receptacle and the nearest point on the sink. It is a point to point measurement. Refer to Figure 210-14 in the 1993 NEC Handbook. 2.

29. 24 CFR 3280.806(b)(1)-NEC 1993, 550-8(d) requires, "Counter tops shall have receptacles located every 6 feet." Is a receptacle required to be 3 feet or 6 feet from the end of the counter top? Does this mean receptacles are to be 6 feet to 12 feet on center?

Answer: According to 550-8(d), the six foot limit is measured between receptacles for the countertops. If the end of the counter is less than six feet from the receptacle, no additional receptacle is required.

30. 24 CFR 3280.808(r)(1). Is a wall with wooden studs and gypsum paneling considered combustible?

Answer: The purpose of paragraph (r) is to codify existing practice and interpretations concerning the maximum allowable gap. The  $\frac{1}{8}$  inch gap applies to gypsum paneling as well as plywood paneling.

31. 24 CFR 3280.808(r)(1)-Is the  $\frac{1}{8}$ " gap addressing the size of the hole in the wall paneling? Or is it concerning the clearance of the rear of the box and other combustible materials, such as Lauan paneling? Or is it for both?

Answer: It addresses the size gap permitted in the wall paneling.

32. 24 CFR 3280.103(b)(2)-For whole House Ventilation: How should manufacturers figure the areas of calculation of additional ventilation of 0.10 air changes per hour. The Air Conditioning Contractors of America's Manual J used the conditioned space to determine the required CFM.

A. Do you include the bath and the kitchen volume in the whole house volume?

Answer: Yes.

B. Do you include the partition's volume that surround the bathroom?

Answer: Yes.

C. Do you include the marriage wall and the endwall volume?

Answer: Yes at the marriage wall; no at the endwall.

D. Which dimension, interior or exterior side of walls, do you use to figure the volume of the house?

Answer: The interior side of wall dimension may be used.

33. 24 CFR 3280.805 (a)(3)(iii)-When is an appliance considered to be an "other continuous duty load" as prescribed in amended 24 CFR 3280.805 (a)(3)(iii) for the purpose of adequately rating the appliance circuit?

Answer: In Article 100 of the NFPA-70-1993 (the National Electrical Code) continuous duty is defined as: "Operation at a substantially constant load for an indefinitely long time." To establish what is a constant load for an indefinitely long time, we must refer to the Article in the National Electrical Code for the specific appliance. If the specific requirements call for a branch circuit rating not less than 125% of the nameplate rating, then it is a continuous duty appliance. Some specific examples are: Article 422-14 (b) for water heaters, Article 424-3(b) for heating equipment, and Articles 440-32 and 440-33 for air conditioning.

## II. The Wind Standards

Questions: 1. 24 CFR 3280-The effective date is July 13, 1994. Does this mean that every home that enters into the first stage of production on that date is to be under the new regulations?

Answer: Every home entering the first stage of production as of July 13, 1994 must comply with the new wind safety provisions.

2. 24 CFR 3280-In the preamble, page 2457, a statement is made that the Department expects to publish revised wind standards for the rest of the country "next year." That statement may have been written in 1993. Please indicate when the Department expects to publish final regulations for the rest of the country.

Answer: We plan to publish revised wind safety standards for the rest of the country sometime in 1994.

3. 24 CFR 3280.304-On page 2463, the preamble indicates that the final rule permits the use of the 1991 NDS without exception. Please clarify that this reference standard shall be used in redesigning homes for Zones II and III not later than July 13, 1994, and for Zone I (the rest of the country) the standard shall be enforced not later than October 25, 1994.

Answer: The use of the 1991 NDS will be enforced for designs in all Wind Zones, including existing

Wind Zone I no later than July 13, 1994.

4. 24 CFR 3280.5(f)-A new data plate entry is specified to indicate that a home has not been designed for ocean/coastal areas, within 1,500 feet of the coastline in Wind Zones II or III, unless it is designed under Exposure D, ASCE 7-88. It would seem that the homeowner will read this and be unsure whether or not the home is designed under either Exposure C or D. Recommend that the data plate so indicate in a positive statement where the home has been designed to be placed, under what exposure.

Answer: The language on the data plate is clear and will avoid placement of homes which have not been designed for the higher design requirements of Exposure D from being installed too close to the coastline.

5. 24 CFR 3280.5(g)-The new data plate statement concerning shutters is in conflict with the requirements of sections 24 CFR 3280.403(f), .404(f), and .405(f). That is, the last sentence of the data plate statement strongly recommends that the home be made ready to be equipped with these devices. However, the sections listed above under Subpart E -Testing (page 2474), say that:

(a) For homes in Wind Zones II and III manufacturers shall design exterior walls (make the homes ready) to allow for installation of protective covers over window and door openings, and

(b) If the manufacturer does not provide protective covers, it must provide homeowner instructions for one method of protecting the openings, and

(c) The instructions shall indicate whether devices, sleeves, or anchors for fasteners have been installed or provided by the manufacturer.

Please modify the new data plate statement to track with these new requirements.

Answer: The new data plate requirements are not in conflict with the provisions of 24 CFR 3280.403(f), .404(f) and .405(f).

6. 24 CFR 3280.303(g)-Staples are not addressed in the 1991 NDS, but they are addressed in UM-25D. Can the 1.6 duration factor for wind from the 1991 NDS be applied to staples?

Answer: The 1.6 load duration factor may not be applied to staples; however, a load duration factor of 1.33 may be used in accordance with UM-25-D.

7. 24 CFR 3280.305(c)(1)(ii)-The new requirement for manufactured home wind loads for high wind areas requires that they shall be designed by a professional engineer or architect. This statement conflicts with an answer in the preamble (page 2465) which indicates that the Department will consider a suggestion for future rulemaking that a professional engineer prepare and certify wind load designs and calculations. Please clarify the new requirement.

Answer: The wind resisting aspects of homes to be located in high wind areas must be designed by a Professional Engineer or Architect as specified by this section of the new wind safety requirements. The statement on Page 2465 of the Preamble should have indicated the Department's decision to require a professional engineer or architect to design homes in high wind areas.

8. 24 CFR 3280.305(c)(1)(ii)-Please specify which designs and calculations shall be sealed by a registered professional engineer or architect. In that there is a DAPIA review of all drawings and calculations, it appears that sealing by a P.E. or architect should be greatly limited.

Answer: As a practical matter, almost all aspects of the manufacturers designs are wind resisting elements and are required to be designed by a Registered Professional Engineer or Architect. This would include, but not be limited to, the following:

- a. all structural systems, assemblies, subassemblies or components and their connections or attachments
- b. exterior covering and sheathing
- c. Window and sliding glass door openings and designs for missile protection

9. 24 CFR 3280.305 (c)(1)(ii)-This section permits the manufactured home to be designed either to option (A): Exposure C, ASCE 7-88, or option (B): The wind pressures in the "Table" in the final rule. We have been advised by the engineering community for the conventional truss industry that truss designs in accordance with ASCE 7-88 are prepared using criteria under "main wind-force resisting systems," rather than under "components and cladding." Please confirm that this standard engineering practice is acceptable for manufactured home trusses where either design options (A) or (B) is selected.

Answer: Trusses are to be designed as "Components" and not as "Main Wind-Force Resisting Elements". The only exception to this would be for a spatial truss framework which is designed as part of Main Frame System. Accordingly, roof trusses are to be designed as "Components" under Subparagraph (A) or by using the design pressures specified in the "Table" in (B).

10. 24 CFR 3280.305 (c)(1)(ii)-The "Table" entry for wall studs incorrectly shows the pressures for "Within 3'0" from each corner" on the line above.

Answer: The "Table" entry for wall studs does contain a typographical error in lining up the Design Pressure with the Element for wall studs "Within 3'0" from each corner of the sidewall and end wall".

11. 24 CFR 3280.305 (c)(1)(ii)-Studs are designed for a lateral load (38 PSF etc.) and no uplift load is specified. Does that mean no combined bending and axial tension is necessary for designing studs?

Answer: Wall studs in sidewalls and end walls are to be designed for combined uplift and lateral loads specified in ASCE 7 or by the Table of Design Wind Pressures.

12. 24 CFR 3280.305 (c)(1)(ii)-For designing roof to wall, wall to floor and floor to chassis connections, what uplift load should be used "anchorage for lateral and vertical stability" or "main wind force resisting system"?

Answer: For designing roof to wall, wall to floor and floor to chassis connections, the lateral and uplift design pressure requirements for Components and Cladding are to be used.

13. 24 CFR 3280.305 (c)(1)(ii)-The following concerns the "Table of Design Wind Pressures" ("Table"):

a. Do the footnotes for the "Table", such as no. 6 on shingle exemption, no. 7 the roof sheathing exemption, and no. 8 the exterior coverings exemption, also apply if method (A), using ANSI/ASCE 7-88, is used instead?

b. Note 4 limits the "Table" to 10 degrees (nominal 2/12) minimum roof slope. Does this mean that they do not apply to a bowstring type roof?

c. If a designer follows ANSI/ASCE 7-88 in method (A), can he ignore the prescriptive element of double trusses in the last 3 feet and have trusses designed accordingly?

d. What are the uplift loads on a porch open on three sides? Are they different if the porch is only open on two sides (as on the end of a multi-section unit)? Do either of these porch configurations have the special 3-foot zones of increased wind pressure (or suction) the walls?

e. Do each of the corners (looking at the plan view) of a double section unit with an offset section have the 3-foot zones as far as wall pressures are concerned, or do these zones only apply to the "outside" corners? Or do these zones only apply to the intersections of the end walls and sidewalls?

f. Concerning bay windows, walk-a-bays, bow windows: do these experience the increased uplift on the roof? Do they count as part of the 3-foot roof zone?

Answers: a. The footnotes on exterior coverings do not apply if Method (A) is used. All exterior coverings and fastenings must be completely designed for the design load provisions of ASCE 7-88.

b. Truss configurations such as bow-string designs with slopes less than 10 degrees are not covered by the "Table".

c. Yes.

d. The uplift design pressures for a 3 sided open porch would be the same as for eaves or gables depending on their location (sidewall or end wall). A porch open on two sides at the end of multi-wide section would be designed for gable loads. Both of these configurations would also be required to be designed for the higher pressures in the 3'0" Zones if located within 3'0" of the corners.

e. The 3'0" regions apply to all corners including offset sections and all other conditions cited by the question.

f. Bay windows, walk-a-bays and bow windows are part of the 3'-0" roof zone unless they are significantly offset below the roof or the roof of the unit completely extends over those projections.

14. 24 CFR 3280.305(c)(1)(ii)-In Zones II and III, under what conditions may a manufacturer meet Exposure B, ASCE 7-88? (e.g. when a home is permanently sited and the authority having jurisdiction verifies the Exposure B authenticity)?

Answer: There are no conditions in Wind Zones II and III for which a home can be designed for Exposure B, ANSI/ASCE 7-88.

15. 24 CFR 3280.305(c)(1)(ii)-In Alaska, which counties are in Zone III?

Answer: There are no defined boundaries for Wind Zone III other than the 90 mph isotach in ANSI/ASCE 7-88 and identified in the Basic Wind Zone Map.

16. 24 CFR 3280.305(c)(1)(iii)-There are many questions concerning recessed entries in Zones II and III if the "Table" is applied:

a. Do the corners of a recessed entry have the 3 foot zones of higher cladding loads for walls?

b. Does the soffit of a recessed entry experience a negative suction? If so, what is the value?

c. Does the soffit of a recessed entry experience a positive pressure, acting upward? If so, what is the value? If so, is this upward pressure an additional load on the roof truss supporting the soffit, or is the truss loading still the same without the recessed entry?

Answers: a. The corners of walls at recessed entries within 3'0" of end walls are to be designed for the 3'-0" wall corner design pressures in the "Table". However, recessed entries which are more than 3'-0" from the end wall and bounded on three sides need not be designed for the higher wall corner loads.

b. Soffits of a recessed entry are to be designed as eaves or gables for the design pressures specified in the "Table".

c. Soffits of recessed entries are to be designed for the eave or gable load requirements of the "Table" as positive pressures acting upward. For the recessed entry area, no additional design pressures are required for evaluation of roof trusses, other than the design pressures for eaves and gables as indicated in b. above.

17. 24 CFR 3280.305(c)(2)(ii)-Table of Design Wind pressures-As indicated by Footnote 8, exterior coverings that are secured at 6" o.c. to a 3/8" structural rated sheathing that is fastened to wall framing members at 6" o.c. need not be evaluated for the design wind pressures shown in the "Table". We assume that the 6" o.c. fastening schedule for both structural sheathing and exterior coverings are measured 6" o.c. vertically along the studs. Please confirm this assumption.

Answer: Footnote 8 requires fasteners to attach from the exterior covering to the structural sheathing at 6" o.c. in both vertical and horizontal directions. However, fasteners need only be installed at 6" o.c. from the structural sheathing to wall framing members (plates, studs, jamb studs, headers). For vertical wall and jamb studs the orientation of the 6" o.c. spacing is in the vertical direction.

18. 24 CFR 3280.305(c)(2)(ii)-"Table" of Design Wind pressures-What is the wind uplift value to be used for stud and jamb stud interaction calculations?

Answer: The design uplift forces to be resisted by studs and jamb studs are the combined uplift loads from the "Table" for trusses (including corner loads from doubling of trusses), and any roof projections (eaves, gables, recessed areas, porches).

19. 24 CFR 3280.305(c)(2)(ii)-"Table" of Design Wind pressures-The 6" o.c. fastening requirement for exterior wall coverings, as indicated by footnote no. 8 under the "Table" of Design Wind Pressures on page 2470 of Federal Register, may pose some difficulties in some cases. For example, how can we fasten the 3/8" sheathing through vertical straps positioned at studs? Double penetration of straps will weaken its holding capability. The problem is compounded by the installation of a final exterior covering that must also be fastened based on 6" o.c., somehow staggered to miss the 3/8" sheathing fasteners and the strap fasteners under the sheathing.

Answer: Fasteners may be staggered at vertical straps to facilitate installation of wall and sheathing coverings and to avoid damage to the strapping material.

20. 24 CFR 3280.306(d)-If over-the-roof ties are required, because that may be the only way to resist the load, it is not clear that diagonal ties would not be required at each vertical tie location along the mating line of multi section homes. This requirement needs further clarification.

Answer: Diagonal ties need not be provided at each vertical over-the-roof tie location along the marriage line of multiple section homes, if all design wind forces can be transferred across the mating line

by the over-the-roof ties and site connections between the units specified in the manufacturer's instructions. Additional information on this subject is provided in our response to Question 26.

21. 24 CFR 3280.305(e)(2) -A new prescriptive requirement for steel strapping for brackets to fasten walls to floors or roof trusses, shall have a maximum spacing of 24 inches on center for Wind Zones II and 16 inches on center for Wind Zone III. From a practical standpoint, the fasteners generally must be placed over studs. Where trusses are not aligned over studs, please confirm that stud-to-truss connections do not have to be direct, provided that indirect load transfers are substantiated.

Answer: Trusses in homes designed for Wind Zones II and III must be aligned over studs for direct connection of the 26 gage metal strapping or brackets required by this section. Trusses may not be offset from studs except where they are added to provide reinforcement or as otherwise required by the design.

22. 24 CFR 3280.305(e)(2)-We want to advise you that since nails will be driven mechanically through the 26-gage straps, their rejection may result in severe injuries to the operator. Therefore, we may have to pre-drill holes through straps and 3/8" sheathing and hand drive fasteners, or use a stronger gun and bigger fasteners.

Answer: It would appear that it may be necessary to pre-drill holes or use larger sized guns or thicker fastener gages to penetrate the 26 gage strapping materials.

23. 24 CFR 3280.306(f)-Revised section 24 CFR 3280.306(d) requires manufactured homes designed for Wind Zones II and III have a supplemental vertical tie installed at each diagonal tie location. A written interpretation is needed to confirm the following:

A. The connection of the vertical strap to the home should be designed for the vertical component of the manufacturer's calculated diagonal tie load (which corresponds with its anchorage instructions). The connection to the home is not required to be designed for 3,150 pounds (4725 pounds ultimate). The vertical strap design on "Table" D2 of HUD's Regulatory Impact Analysis (RIA) agrees with this assumption. 10-8 screws per strap calculates to approximately 1,500 pounds per vertical tie.

Answer: Connections of vertical ties to wall framing members need not be designed for the 3,150 working load requirements of the tie itself provided the fastening system and the member to which it is attached are capable of resisting the calculated design load imposed on the vertical tie.

B: The connection of the vertical strap may be located at the I-Beam, provided that the floor-to-frame connection is substantiated. In some designs this may be the preferred location (e.g. 5' o.c. diagonal tie spacing with a 6' patio door at sidewall).

Answer: Vertical ties may be provided under the main chassis beams provided the design has



considered the transfer of all loads assuming the vertical tie to be positioned under the I beam.

24. 24 CFR 3280.306(f)-Since the Department will now require a vertical tie at each diagonal tie for Wind Zones II and III, how does HUD envision that ties will be properly secured to wall members so that the attachment point on the manufactured home is capable of resisting the tie allowable working load of 4,725 pounds?

Answer: Vertical ties can be installed as continuous ties or connected to wall framing members by mechanical fasteners. Additional information on this subject is provided in our response to Question 23.

25. 24 C.F.R. 3280.306(c)(2), (d) and (f)-Taken together 24 CFR 3280.306(c)(2), (d) and (f) could mean that HUD staff anticipates over-the-roof straps at each diagonal tie. If so, what is the purpose of 26-gauge uplift straps and stronger trusses?

Answer: Vertical ties are required to be positioned at each diagonal tie for gross stability against overturning. The ties between the roof and sidewall are required to resist the high localized uplift forces and to prevent roof system failures and separation from the wall system.

26. 24 CFR 3280.306 (f) -Please also confirm that a diagonal tie is not required at each vertical tie, both on the perimeter and along the marriage wall.

Answer: For anchoring systems used with multiple section units, vertical and diagonal ties may not be required at the marriage wall provided all wind forces can be designed to be transferred across the mating line without their use. However, diagonal and vertical ties are mandatory at the perimeter or exterior sidewall.

27. 24 CFR 3280.306 (f)-We would also like permission to fasten a vertical tie at the I-beam, provided that the floor-to-frame connection is substantiated.

Answer: Vertical ties may be provided under the main chassis beams provided the design has considered the transfer of all loads assuming the vertical tie to be positioned under the I beam.

28. 24 CFR 3280.403(f), 404(f) and 405(f): The manufacturer is to specify at least one method of protecting exterior openings, without taking the home out of conformance with the standards. How does the Department envision that a manufacturer might take the home out of conformance with the standards when it designs exterior walls surrounding exterior openings to allow for the installation of shutters or protective covers?

Answer: One example of how a home could be taken out of conformance with the Standards is to reduce the capacity of wall framing members due to excessive fastening patterns or large holes needed to install the shutters or protective covers.

Dated: April 15, 1994.

Nicolas P. Retsinas,

Assistant Secretary for Housing-Federal Housing Commissioner.

[FR Doc. 94-9689 Filed 4-18-94; 3:36 pm]